DOE F 1325.8
(8-89)
EFG (07-90)

United States Government **Department of Energy**

Memorandum

DATE: OCT 11 2007

REPLY TO ATTN OF: EM-60 (Dr. James Shuler, 301-903-5513)

SUBJECT: Issue Revision 5 of DOE Certificate of Compliance for NAC-LWT Cask

TO: Paul Mann, NA-124

Under your direction, Sandia National Laboratories (SNL) requested that the DOE Certificate of Compliance (CoC) No. 9225 for the Model NAC-Legal Weight Truck (LWT) cask be revised to allow SNL Debris Bed Experiments (DBE) contained in welded DBE Transport Canisters as authorized contents. This request has been approved. Attached for your information is Revision 5 of Department of Energy CoC No. 9225, the Safety Evaluation Report for this revision, and the Approval Record. The certificate has been issued with an expiration date of October 31, 2012.

If you have any questions, please contact Dr. James Shuler at (301) 903-5513.

Dae Y. Chung
Headquarters Certifying Official
Safety Management and Operations
Office of Environmental Management

Attachments

cc:
James Shuler, EM-60
Connie Rogers, NA-123
Frederick Sexton, SNL
Yung Li, ANL

DOE F **5822.1**
(5-85)
(Formerly EV-618)

U.S. DEPARTMENT OF ENERGY
CERTIFICATE OF COMPLIANCE
For Radioactive Materials Packages

OMB Approval
No. 1910-2000

1a. Certificate Number	1b. Revision No.	1c. Package Identification No.	1d. Page No.	1e. Total No. Pages
9225	5	USA/9225/B(U)F-96 (DOE)	1	5

2. PREAMBLE

2a. This certificate is issued under the authority of 49CFR Part 173.7(d).

2b. The packaging and contents described in item 5 below meet the safety standards set forth in subpart E, "Package Approval Standards" and subpart F, Package and Special Form Tests" Title 10, Code of Federal Regulations. Part 71.

2c. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. This certificate is issued on the basis of a safety analysis report of the package design or application –

(1) Prepared by (Name and address):	(2) Title and Identification of report or application:	(3) Date
U.S. Department of Energy Sandia National Laboratories Nuclear Weapons Science & Technology Programs Center P.O. Box 5800 Albuquerque, NM 87185	Safety Analysis Report for Packaging for the NAC Legal Weight Truck Cask, Revision LWT(DOE)-06D September 2006 as Supplemented by LWT/DOE-07E September 2007	Sept. 2007

4. CONDITIONS

This certificate is conditional upon the fulfilling of the applicable Operational and Quality Assurance requirements of 49CFR parts 100-199 and 10CFR Part 71, and the conditions specified in item 5 below.

5. Description of Packaging and Authorized Contents, Model Number, Transport Index, Other Conditions, and References:

(a) Packaging

(1) Model No.: NAC-LWT

(2) Description:

The NAC-LWT is a steel-encased, lead-shielded shipping cask. The cask is approved for transport of Sandia National Laboratories (SNL) Debris Bed Experiments (DBE) contained in welded stainless steel DBE Transport Canisters. The DBE Transport Canister provides a secondary leaktight boundary for the DBE contents.

When presented for transport, the cask contents will be up to three individual DBE Transport Canisters and appropriate spacers as required.

6a. Date of Issuance: OCT 11 2007	6b. Expiration Date: October 31, 2012

FOR THE U.S. DEPARTMENT OF ENERGY

7a. Address (of DOE Issuing *Office)*	7b. Signature, Name, and Title (of DOE Approving Official)
U.S. Department of Energy Safety Management and Operations (EM-60) 1000 Independence Avenue, SW Washington, DC 20585	Dae Y. Chung Headquarters Certifying Official Office of Environmental Management

The overall dimensions of the package, with impact limiters, are 589 cm (232 in.) long by 166 cm (65.3 in.) in diameter. The cask body is approximately 508 cm (200 in.) in length and 112 cm (44 in.) in diameter. The cask cavity is 452 cm (178 in.) long and 34.0 cm (13.4 in.) in diameter. The volume of the cavity is approximately 411 liters (14.5 cubic feet).

The cask body consists of a 1.91-cm (0.75-in.) thick stainless steel inner shell, a 14.61-cm (5.75-in.) thick lead gamma shield, a 3.1-cm (1.2-in.) thick stainless steel outer shell, and a neutron shield tank. The inner and outer shells are welded to a 10.1-cm (4-in.) thick stainless steel bottom end forging. The cask bottom consists of a 7.6-cm (3-in.) thick, 52.71-cm (20.75-in.) diameter lead disk enclosed by a 8.9-cm (3.5-in.) thick stainless steel plate and bottom end forging. The cask lid is 28.7-cm (11.3-in.) thick stainless steel stepped design, secured to a 36.2-cm (14.25-in.) thick ring forging with twelve 2.5-cm (1-in.) diameter bolts. The cask lid seal is a metallic O-ring. A second teflon O-ring and a test port are provided to leak test the seal. Other penetrations in the cask cavity include the fill and drain ports, which are sealed with Alternate B port covers and metallic O-rings. A second Viton O-ring and test port are provided on each Alternate B port cover to leak test the metallic seal.

The neutron shield tank consists of a 0.6-cm (0.24-in.) thick stainless steel shell with 1.3-cm (0.5-in.) thick end plates. The neutron shield region is 417 cm (164 in.) long and 12.7 cm (5 in.) thick. The neutron shield tank contains an ethylene glycol/water solution that is 1% boron by weight.

The cask is equipped with aluminum honeycomb impact limiters. The top impact limiter has an outside diameter of 166 cm (65.3 in.) and a maximum thickness of 71 cm (28 in.) The bottom impact limiter has an outside diameter of 153 cm (60.3 in.) and maximum thickness of 72 cm (28.5 in.). Both impact limiters extend 30.5 cm (12 in.) along the side of the cask body.

(3) Drawings:

The package is constructed in accordance with the following NAC International drawings:

315-40-02, Rev. 21 (Sheets 1-2)	NAC-LWT Cask Body Assembly
315-40-03, Rev. 22 (Sheets 1–7)	NAC-LWT Cask Body
315-40-04, Rev. 11	NAC-LWT Cask Lid Assembly
315-40-05, Rev. 9	NAC-LWT Upper Impact Limiter
315-40-06, Rev. 9	NAC-LWT Cask Lower Impact Limiter
315-40-08, Rev. 16 (Sheets 1-5)	NAC-LWT Parts Detail
315-40-117, Rev. 3	Canister Assembly, SNL Experiment Shipment
315-40-118, Rev. 2 (Sheets 1-2)	Details, Canister Weldment, SNL Experiment Shipment

315-40-119, Rev.2 (Sheets 1-3)	Details, Canister Lid, SNL Experiment Shipment
315-40-138, Rev.3 (Sheets 1-5)	Legal Weight Truck Transport Cask Assy, SNL Experiment Transport Configurations
315-40-144, Rev. 2 (Sheets 1-3)	Legal Weight Truck, Transport Cask Assy, SNL Spacer

(b) Contents:

Up to three Sandia National Laboratories (SNL) irradiated Debris Bed Experiments (DBE) as listed in Table 1.2-10 of the SARP. Characteristics of each authorized DBE content are limited to:

Characteristic	Maximum Value
DBE Weight	450 lbs
DBE Transport Canister Loaded Weight	1,100 lbs
DBE Length (w/o Handling Adapters)	75 inches
DBE Transport Canister Length	90 inches
^{235}U Mass per DBE	8.0 kg
^{235}U Enrichment	94%
Activation Source Term	15.3 Ci ^{60}Co
Irradiation Time	80 hours
Heat Load per Cask	100 W

The minimum cool time is 10 years. Each DBE must be contained in a welded stainless steel DBE Transport Canister.

(c) Conditions:

(1) In addition to the requirements of 10 CFR Part 71, Subpart G:

(i) Except as specified in Condition 5(c)(5) of this Certificate, the package must be prepared for shipment and operated in accordance with the Operating Procedures of Chapter 7 of the SARP. The cask cavity must be backfilled with 1.0 atm helium when shipping SNL DBE contents.
(ii) Verify NAC-LWT cask Units 6, 7 and 8 are decontaminated of tritium.
(iii) Each package must meet the Acceptance Tests and Maintenance Program of Chapter 8 of the SARP.
(iv) The package must be configured in accordance with NAC International Drawing 315-40-138, Rev. 3.
(v) Metallic O-ring seals must be replaced prior to each shipment.
(vi) Prior to each shipment, after loading, each cask containment seal must be tested to show no leakage greater than 2×10^{-7} std-cm^3/s (helium)

(2) In addition to the marking requirements of 49 CFR Part 172, Subpart D, each cask must be durably and legibly marked on the outside of the cask with

(i) The model number

(ii) The DOE package identification number, and

(iii) A serial number that uniquely identifies each cask which conforms to this certificate.

(3) All package activities authorized by this certificate must be performed in accordance with the packaging-specific quality assurance requirements of Chapter 10 of the SARP.

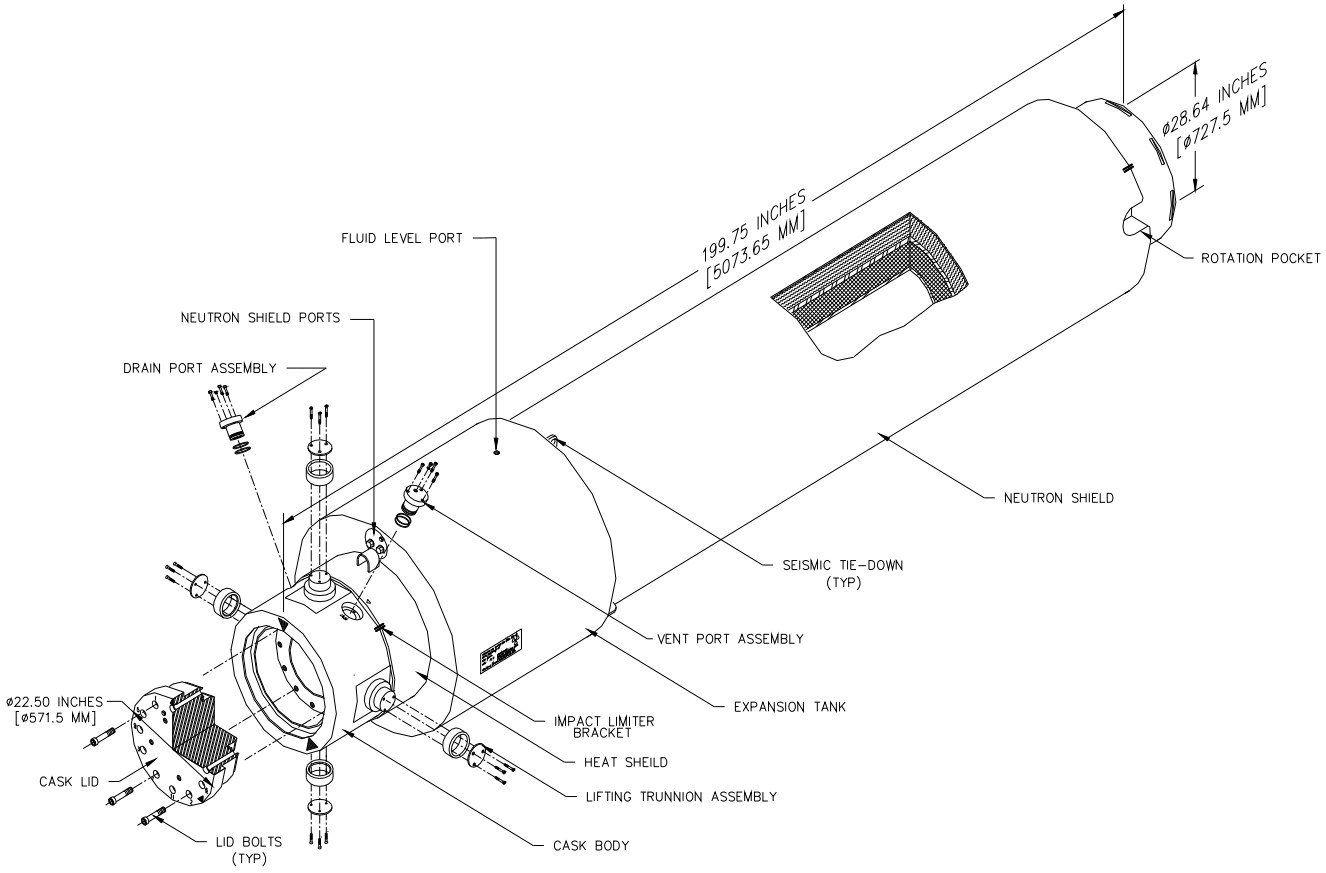
(4) This package may be transported only by a carrier who satisfies the requirements of 49 CFR Part 397 with regard to routing of a highway route controlled quantity of Class 7 (radioactive) materials and training for drivers who transport a highway route controlled quantity of Class 7 (radioactive) materials.

(5) This package may be transported only as exclusive use.

(d) Criticality Safety Index

The Criticality Safety Index CSI for the NAC-LWT with authorized SNL DBE contents is zero. (CSI = 0)

NAC-LWT
CASK BODY



Department of Energy
Washington, DC 20585

OCT 1 1 2007

PACKAGE CERTIFICATION APPROVAL RECORD
Certificate of Compliance USA/9225/B(U) (DOE), Revision 5
NAC-LWT Cask

Docket 06-10-9225

Revision 5 of Certificate of Compliance USA/9225/B(U) (DOE) for the NAC-LWT cask is issued to allow SNL Debris Bed Experiments (DBE) contained in welded DBE Transport Canisters as the authorized content. The expiration date of Revision 5 is October 31,2012.

This certificate constitutes authority for the Department of Energy to use the NAC-LWT cask for shipment of the authorized contents under 49 CFR 173.7(d).

Dae Y. Chung
Headquarters Certifying Official
Safety Management and Operations
Office of Environmental Management

Date: 10/11/07